



natural gas



PHOTO: ENCANNA

BACK PAGE

New Station Open

Encana recently opened a new fuelling station in southern Alberta to support our growing fleet of cars and trucks that use natural gas.

MESSAGE FROM THE GENERAL MANAGER

A year of accomplishments

Greetings and welcome to the December 2011 edition of the Deep Panuke newsletter.

As we approach the end of the year, it is timely to reflect on the last 12 months. At the Deep Panuke project, much was accomplished in 2011 to prepare for first gas.

Last month, the subsea program wrapped up to prepare the wells and other subsea structures for natural gas production. The work was completed by contractor Subsea 7. To learn more about these activities, see the article below and turn the page to read the Ask the Expert column.

As well, final work over the summer months and into the fall on the gas export pipeline ensures it is now ready to accept gas from Deep Panuke, providing a pathway for the gas to reach market. And offshore, hook-up and commissioning work continues at the PFC following the successful installation of the facility over the summer months.

In this edition of the newsletter, we profile Azadeh Entesarian, Quality Advisor to the Deep Panuke project. We'll share the story of a tropical hitchhiker rescued by the crew of a Deep Panuke supply vessel and how a mighty leap by a contract Cost Analyst at Deep Panuke supported Easter Seals in Nova Scotia.

We also outline the six research projects awarded grants in 2011 under the theme of offshore safety and risk. And we're pleased to report that we've received

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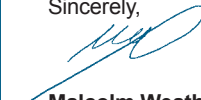
eight submissions under the theme of offshore geosciences in response to the latest Deep Panuke research call. For more information on research and development at Deep Panuke, please see page 3.

At Encana, we are committed to expanding the use of natural gas in North America as a transportation fuel. A recent achievement was the opening of a new fuelling station in Alberta to support Encana's growing fleet of vehicles using clean, abundant and affordable natural gas. See the back page of this newsletter for more information.

At Encana, we welcome your comments and feedback on this newsletter. Please contact us at dpinfo@encana.com.

As we prepare to welcome in the New Year, enjoy the holidays with family and friends, drive safe wherever your travels take you and best wishes to all.

Sincerely,



Malcolm Weatherston
General Manager, Deep Panuke Project
Encana Corporation



PHOTO: DAVE NICHOLS, PRISMA PRODUCTIONS



Message from the Vice-President
Transitioning to first gas

In 2005, it was my pleasure to be named Vice-President of Atlantic Canada for Encana, responsible for the development of the Deep Panuke project.

Since then, much progress has been made at Deep Panuke, with key milestones completed including the successful installation this summer of the offshore field centre.

With a shift from construction to steady state operations as we close in on first gas, we are transferring the Deep Panuke property to Encana's Clearwater business unit.

As a result, effective January 1, 2012, responsibility for Deep Panuke will transition to Mike Selleck, the Vice-President of Clearwater. Mike and I will work together through a transition period from January 1 until first gas. I will continue with my previously announced responsibilities with the Kitimat LNG project on the West Coast of Canada

and assume the title of Vice-President, Canadian LNG.

I would like to take this opportunity to thank the Encana team in Nova Scotia and all the Deep Panuke contractors for their hard work to make the project a reality. As well, the support of many other stakeholders—including all levels of government in Nova Scotia and the local community—has been appreciated.

Many hands have been needed, and your efforts have helped to make Deep Panuke a success.

Best wishes to you all for safe and happy holidays.

Sincerely,
Dave Kopperson
Vice-President, Atlantic Canada
Encana Corporation

PHOTO: ENCANNA

Project update—subsea program



PHOTO: ENCANNA

The Acergy Discovery at work at Deep Panuke: The subsea program in 2011 at Deep Panuke focused on preparing the offshore wells and flowlines for natural gas production, and supporting installed structures offshore with rock placement. Lead subsea contractor Subsea 7 mobilized two vessels to Nova Scotia, the *Acergy Falcon* and the *Acergy Discovery* (pictured above), to conduct work on the subsea program. Rock placement contractor Tideway mobilized the *Tideway Rollingstone*. All vessels used the Mulgrave Marine Terminal of the Strait Superport at Mulgrave, NS as a base of operations. This newsletter will focus on the activities of Subsea 7. See inside for more information on what happened this year.

PHOTO: DAVE NICHOLS, PRISMA PRODUCTIONS



Adrian Wylde
Subsea and Pipelines Lead, Deep Panuke Project

You've got questions. Deep Panuke experts can answer.

Q. Can you describe work completed by Subsea 7 in 2011 to get ready for first gas at Deep Panuke?

A. Subsea 7 was the principal subsea contractor for Deep Panuke. In early July, Subsea 7 mobilized two vessels to Nova Scotia—the *Acergy Falcon* (Fig. 1) and the *Acergy Discovery* (Fig. 2).

The *Acergy Falcon* installed umbilicals alongside the flowlines it installed last year. The umbilicals allow for the remote operation of the wells at Deep Panuke, with the flowlines transporting natural gas from the wells to the production platform. In 2011, the vessel also installed the umbilical for the acid gas injection line, which transports carbon dioxide and hydrogen sulphide removed from Deep Panuke natural gas to a disposal well. The umbilicals were stored on a carousel in the hold, and spooled off and over the side of the vessel to the seafloor.

Among its first tasks, the *Acergy Discovery* installed the subsea isolation valve (SSIV) and protection structure on the seabed (Fig. 5a). To secure the SSIV, four steel piles were driven 19 metres into the seabed (Fig. 2, Fig. 5b). The SSIV plays an important safety role since, in the event of an emergency, it isolates the production platform (PFC) from the natural gas in the Deep Panuke export pipeline to shore.

The *Acergy Discovery* also was responsible for installing structures such as spool pieces, umbilical chutes, J-tube extension frames and concrete mattresses and covers.

Spool pieces are sections of pipe built according to field measurements to connect pipelines with structures (Fig. 5c). For example, the connections could be where the flowlines meet the wells or where the gas export pipeline meets up with

the PFC (Fig. 3). The umbilical chutes are steel guides used to support the flexible umbilicals when they transition from the wells to the seabed (Fig. 5d).

J-tubes are the conduits that carry the umbilicals to the PFC through the riser caisson, which is the gathering point for all the flowlines and umbilicals at the platform and the platform's "5th" leg. The J-tube extension frames support the umbilicals as they exit the caisson and ensure each umbilical reaches the seabed in a controlled manner (Fig. 4).

The concrete mattresses and covers are required to protect the spools and umbilicals, and the gas export pipeline where spools were used to connect it to the PFC (Fig. 5e). The protection is needed from the effects of high seafloor currents encountered at Deep Panuke, especially during storms. The mattresses also provide protection from dropped objects.

Working to tie everything together offshore were four teams of saturation divers based on the *Acergy Discovery* who lived and worked at seabed pressure for up to 28 days at a time. The divers worked together on the seabed in groups of three around the clock. This process continued for about 4 ½ months until the subsea work was complete.

Before leaving Nova Scotia last month, the *Acergy Discovery* also supported the pressure testing and dewatering of the flowlines, and the final electrical connections between the wells and the PFC, in preparation for first gas from Deep Panuke.

Have a question? Contact us at dpinfo@encana.com

Sharing the Sand

For the subsea program at Deep Panuke, thousands of sand bags were prepared in Nova Scotia by Shaw Resources of Hardwoodlands, NS. The sand bags were needed as a contingency in case of erosion around the footings of the production field centre before permanent erosion protection, in the form of rock placement, could be installed. As it turns out, the rocks were installed by contractor Tideway before natural seabed erosion could occur and the sand bags, each weighing about 25 pounds, became surplus. Encana donated 20,000 sand bags to the Province of Nova Scotia, to be used as needed to support emergency operations. The Town of Mulgrave also received surplus sand bags. For more information on rock placement at Deep Panuke as part of the subsea program, see the June 2011 edition of the Deep Panuke newsletter.



Fig. 1 *Acergy Falcon* at the Mulgrave Marine Terminal.



Fig. 4 Installing a J-tube extension frame from *Acergy Discovery*. At left is the Deep Panuke PFC.



Fig. 2 Steel piles for the SSIV ready for loading to *Acergy Discovery*.



Fig. 3 Overboarding a spool piece for the gas export pipeline from *Acergy Discovery* to the seabed.



Fig. 5 *Acergy Discovery* at the Mulgrave Marine Terminal loaded for transit to Deep Panuke. In the background is the *Fairmount Expedition*, a vessel used during the installation of the PFC. Behind the *Fairmount Expedition* are piles of rock for the rock placement program at Deep Panuke.

PHOTOS: ENCANA (FIG. 1,3,4-5); DAVE NICHOLS, PRISMA PRODUCTIONS (FIG. 2)

Research and development

New offshore safety and risk research

Encana is funding six new research projects examining topics under the theme of offshore safety and risk. The projects received grants under a Call for Proposals launched in late 2010 to researchers in Nova Scotia. The call is an activity under the Deep Panuke Education & Training and Research & Development Fund. The funded projects are:

- At Saint Mary's University, research led by Mark Fleming that aims to develop new methods to assist oil and gas companies operating offshore to better monitor and positively influence the safety culture. This collaborative research project will draw on expertise from across the offshore industry both locally and internationally. For more information, please visit www.smu.ca/newsreleases/2011/11222011MarkFleming.html.
- At Helly Hansen Canada Limited in Dartmouth, NS, research to study clothing system improvements to provide added safety for offshore helicopter transport suit wearers.
- At Pro-Oceanus Systems Inc. in Bridgewater, NS, research to develop a new sensor aimed at quickly and accurately measuring the presence of hydrogen sulphide on an offshore platform.
- At Survival Systems Training Limited in Dartmouth, NS, research led by Michael Taber to examine the effect of training on Helicopter Underwater Emergency Breathing Apparatus (HUEBA) performance under realistic conditions. The HUEBA provides users with additional breathable air.
- At Survival Systems Training Limited in Dartmouth, NS, research led by Michael Taber to develop and test an offshore-specific emergency response protocol for hydrogen sulphide training.

- At Dalhousie University, research led by John Kozey and his collaborators using new 3-D scanning technology to measure the body characteristics of offshore workers. This information could be used for workspace design as well as fitting workers in the survival suits used for transport by offshore helicopter.

For more information on research and development supported by Encana in Nova Scotia, please visit www.encana.com/deeppanuke.

New research call: offshore geosciences for Nova Scotia

A new research call is underway to support geosciences research in Nova Scotia for the province's offshore. The call is being managed on Encana's behalf by the Offshore Energy Technical Research Association (OETRA). Eight submissions were received from Nova Scotia researchers by the deadline of December 9. In the coming weeks, a review committee will select finalists from this group to submit full research proposals for consideration. It is expected that research grants from the call will be awarded in the spring of 2012. For more information on the new call, please visit www.offshoreenergyresearch.ca/Home/Encana/tabid/453/Default.aspx.

Deep Panuke project

Encana people

Azadeh Entesarian, Quality Advisor

Attention to detail and being well organized are key skills for Azadeh Entesarian in her role as Quality Advisor for the Deep Panuke project.

At Deep Panuke, Azadeh monitors contractor processes, supplies and documentation to ensure everything is in order. Monitoring can take the form of reviews, third party inspections and audits of work. On a project the size of Deep Panuke, this monitoring helps to keep work on track and ensures contractors adhere to commitments. Azadeh's work is part of the of the Environment Health Safety and Quality team at Deep Panuke.

In her role, Azadeh has had the opportunity to work at some of the manufacturing and installation sites for Deep Panuke, performing audits at offices in Europe and Malaysia as well as work offshore on the pipelay vessel for the gas export pipeline and the drilling rig.

She is a lead auditor for ISO14001 (Environmental management system), OHSAS18001 (Health and safety management systems) and ISO9001 (Quality management systems). Currently a member of the Canadian Standards Association, Azadeh attends national and international ISO quality management system congresses and meetings for developing the ISO9000 standards series.

Azadeh offers good advice to anyone contemplating a career in the offshore oil and gas industry: "If you are up for it, it is not close to any form of 'routine' work," she says. "But once you try it out, you will probably never want to leave this industry."

As a twin, Azadeh knows the importance of teamwork, collaboration, compromise and trust. She was born in Tehran, Iran and holds a Bachelor of Industrial Engineering (Safety Engineering) and an Executive Master of Business Administration.

She moved to Nova Scotia in 2006 after working abroad on quality, health and safety and environment projects in a number of industries—joining the offshore oil and gas industry about 12 years ago. Since then, she has worked on projects such as oil refineries, natural gas pipelines and a platform built on an artificial industrial island in the Persian Gulf. Azadeh joined Encana and the Deep Panuke project in February 2009.

This year, Azadeh proudly became a Canadian citizen. "Being part of a country that has a reputation for being peaceful, positive and friendly, and now calling it 'Home', is a great feeling," she says.

Azadeh is a new volunteer with Immigrant Settlement and Integration Services (ISIS), an organization in Nova Scotia that helps immigrants find their career path. She enjoys spending her spare time with her husband and two children, and working towards meeting the goals she has set for herself—a life plan mapped all the way to age 91 that is full of career growth, family, activities, travel and other interests.

One of Azadeh's personal goals: Before the end of 2011, to finish her 5' x 4' oil painting of a wild horse. Giddyup!



PHOTO: DAVE NICHOLS, PRISMA PRODUCTIONS

A Condor rescues a wandering tropical bird



Encana has thanked the crew of the *Atlantic Condor*, the Deep Panuke offshore supply vessel, for their help in rescuing a hitchhiking tropical bird. When the vessel was returning to Halifax from the Deep Panuke platform on July 30, a Purple Gallinule was found on board. The typical range for this unmistakable bird—with its yellow feet, purple-blue plumage and red and yellow bill—is tropical and subtropical America. However, the Purple Gallinule does wander further north and can be a rare visitor to Nova Scotia. In this case, the bird may have "jumped ship" to the *Atlantic Condor* from another vessel heading north. Environment Canada's Canadian Wildlife Service recommended bringing the bird back to shore and releasing it in a marsh habitat. The crew of the *Atlantic Condor* did an outstanding job catching the bird and building a cage to house it in for safe transport to shore. Peter Taylor, the logistics superintendent for Single Buoy Moorings (SBM), the operator of the Deep Panuke platform, also played a key role by releasing the bird at a small pond in Bedford, NS (pictured above) where it showed normal behaviour (drinking water and picking around in the grass) during subsequent checks. The next day, the bird could not be seen. The NS Rare Bird Alert website later reported sightings of a Purple Gallinule along the South Shore of Nova Scotia in early to mid-August. It would seem this hitchhiking visitor was heading south toward home.

PHOTO: ENCANA

Encana volunteer in action

Over the edge for Easter Seals

It takes courage to rappel down the side of an office building. Will Cruickshank, a contract Cost Analyst at Deep Panuke, made the jump to support a good cause.

It took Will about seven minutes to descend down the side of a 23-storey building in downtown Halifax to raise funds for Easter Seals in Nova Scotia as part of that organization's Drop Zone event.

Will raised a total of \$2,935, or about \$9 per foot for the 323 foot drop from the roof to the street.

The Deep Panuke project supports Easter Seals in Nova Scotia through direct funding for programming, particularly the New Leaf Enterprises program. New Leaf works with adults with physical disabilities to develop job skills. Clients of New Leaf are

responsible for the mail out of this newsletter.

To learn more about Easter Seals in Nova Scotia, please visit www.easterseals.ns.ca.



Will Cruickshank, contract Cost Analyst at Deep Panuke, prepares to drop 23 stories in support of Easter Seals.

PHOTO: EASTER SEALS NOVA SCOTIA

Natural gas economy

New station for growing natural gas network

Encana has a growing fleet of vehicles powered by natural gas—and its subsidiary, Encana Natural Gas Inc., has a new fuelling station to help meet the demand.

The new compressed natural gas fuelling station in Strathmore, Alberta will service Encana's fleet of pick-ups and cars, and is planned to eventually open to other corporate fleets and the public.

To date, Encana has 128 of its approximately 1,400-vehicle North American fleet running on natural gas, as well as 15 onshore drilling rigs, and continues to further expand its conversion program.

Encana is investing in the stations to help build the necessary infrastructure to support the expanded use of natural gas as an alternative fuel to gasoline or diesel. Operating a fleet of vehicles on natural gas is both an economic and environmental



Encana's new natural gas fuelling station in Strathmore, Alberta.

advantage for Encana, highlighting that natural gas is a reliable, clean and affordable fuel.

The station in Strathmore joins other natural gas fuelling stations in Colorado, British Columbia, Louisiana

and Wyoming—the building blocks in the growing natural gas highway network in North America.

For more information on the role of natural gas in the transportation sector, visit www.encana.com.

Did you know?

Natural gas as a transportation fuel means cleaner air since natural gas vehicles are far less emissions-intensive than gasoline or diesel:

- 99 percent less sulfur dioxide
- 90 percent less particulate matter
- 89 percent less volatile organic compounds
- 75 to 95 percent less nitrogen dioxide
- 70 to 90 percent less carbon monoxide
- 20 to 30 percent less carbon dioxide

PHOTO: ENCANNA

Onshore rig initiative

Made with pride in Nova Scotia

Two drilling rigs built in Nova Scotia are busy at work in the onshore oil and gas industry—putting the province on the map for future opportunities.

The rigs were constructed under a commitment by Encana to help develop the capacity in the province for the construction of rigs and rig components. The first rig was delivered early in 2011 with the second rig ready in the spring of 2011. Both rigs are now at work drilling for natural gas in North Dakota.

The onshore rig initiative started in late 2006 when several Nova Scotia contractors were tapped to build land rig components for major drilling contractors in Western Canada. Building on that success, RKO Steel Limited led the project to then manufacture two complete, conventional drilling rigs for Nabors beginning in mid-2008.

Skills transferred to Nova Scotia through the onshore initiative include precise fabrication, drafting and 3-D modeling skills for engineering, design, drafting and construction personnel.

Among the Nova Scotia subcontractors working on the rigs were electrical, piping/mechanical and coatings companies, steel fabricators and suppliers, crane operators and shippers.



One of the two onshore drilling rigs built in Nova Scotia.

There are few manufacturers who can build drilling rigs from top to bottom, especially outside major onshore oil and gas producing provinces and states. With drilling activity recovering in North America, the initiative has helped to provide rig companies with skilled, dependable contractors here in Nova Scotia. In fact, RKO has since secured additional onshore work, showing that the intent of the initiative has been met.

Encana has contributed \$4.6 million to the onshore rig initiative.

PHOTO: RKO STEEL

Tidal update

Room with a view



The interpretive centre for the tidal power project in Nova Scotia's Bay of Fundy opened last month. The centre, located on the outskirts of Parrsboro, NS, includes educational displays on tidal power, research and community facilities. The site overlooks the Minas Passage where underwater tidal turbines are slated to be deployed. The Fundy Ocean Research Center for Energy (FORCE) is overseeing the tidal power project, which is supported by Encana as a funding partner. To learn more about FORCE and tidal power in Nova Scotia, visit www.fundyforce.ca.

PHOTO: PROVINCE OF NOVA SCOTIA

FOR MORE INFORMATION

Contact Encana in Halifax for more information on the Deep Panuke project and other Encana activities:

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Halifax, Nova Scotia B3J 3M8

If you are interested in working on the Deep Panuke project or in other opportunities with Encana, watch for postings under the Careers section at www.encana.com.

For information on contracting with Encana elsewhere across our operations, please visit www.encana.com.

For information on the company responsible for the provision of the production field centre at Deep Panuke, visit www.sbmoffshore.com or contact:

Oivind Tangen, Unit Manager, SBM Nova Scotia Contractors Inc.
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For industry information, please visit The Maritimes Energy Association at www.otans.com.

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